

REMARKS/ARGUMENTS

After the foregoing Amendment, Claims 1, 3-30, 32-37 are currently pending in this application. Claims 2 and 31 have been canceled without prejudice. Claims 1, 3, 6-12, 14, 15, 17-19, 23-25, 27, 30, and 33 have been amended to more particularly and distinctly claim the subject matter of the present invention. New claim 37 has been added to more distinctly claim subject matter which the Applicants regard as the invention. Applicants submit that no new matter has been introduced into the application by these amendments.

Double Patenting Rejection

Claims 1-36 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-26 of copending U.S. Patent Application No. 10/845,829, and over claims 1-35 of copending Application No. 10/730,671. A Terminal Disclaimer is submitted herewith to overcome the obviousness-type double patenting rejection. The withdrawal of the provisional obviousness-type double patenting rejections is respectfully requested.

Claim Rejections - 35 USC §112

Claims 1, 6, 12, 19, 23, 27, and 33 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Claims 1,

6, 12, 19, 23, 27, and 33 have been amended and withdrawal of this rejection is respectfully requested.

Claim Rejections - 35 USC §102(e)

Claims 33-36 stand rejected under 35 U.S.C. §102(e) as being anticipated by United States Application No. 2004/0204108 Etkin et al. (hereinafter "Etkin").

Claim 33, as presently amended, recites a method for coordinating the use of beam forming between two communicating entities comprising the step of:

...reducing at least one adjustment parameter of a beam transmitted from at least one of the base station or the WTRU communicating with each other using beamed formed transmission and reception signals...

Etkin discloses a method wherein a base station is configured to perform time-varying beam forming operations through the use of one or more antenna arrays in conjunction with a forward power modulator (FPM) scheme or similar scheme (see Etkin, paragraph [0047]). Beam forming is defined as forming the directional antenna gain pattern for the forward link of a base station (see Etkin, paragraph [0047]). In Etkin, the base station adjusts beam width and induced SINR fluctuations based on the reported DRC from the mobile stations (see Etkin, paragraphs [0049] and [0050]).

Unlike the present invention, Etkin is not related to adjusting the alignment of beams emanating from a base station and a WTRU as recited in amended claim 33. Instead, Etkin is directed to adjustment of beam width and induced SINR fluctuations in accordance with the number of mobile stations in a sector to maximize the throughput of the base station, not an alignment of two beams. Specifically, Etkin teaches the using an antenna array at the base station, consisting of at least two antennas, to transmit the same signal so that the beam from one of the antennas creates a constructive/destructive interference pattern with the beam of the other antenna resulting in a modified time-varying antenna gain pattern, which is possibly narrower and more directional than either of the two individual antenna gain patterns. (see Etkin, paragraph [0047]). Etkin fails to disclose adjusting parameters of a beam such that a degree of alignment between beams is above a threshold.

The creation of a beam pattern using an antenna array as disclosed in Etkin is fundamentally different than the coordination of multiple beams emanating from the base station, the WTRU, or both devices as disclosed in amended claim 33. Paragraph [0047] of Etkin, as cited by the Examiner, is not related to performing time-varying beam forming operations between a base station and a WTRU, but rather teaches using a plurality of antennas at the base station to create a beam

forming pattern. Unlike the claimed invention, Etkin fails to disclose coordinating beams emanating from the WTRU.

In addition, Etkin fails to disclose a method of coordinating beam forming on both the forward and reverse links of the base station. As stated above, the method disclosed in Etkin is limited to forming an antenna gain pattern on the forward link of a base station and is performed exclusively at the base station (see Etkin, paragraph [0047]). As such, amended claim 33 is further distinguishable over Etkin.

Finally, the method disclosed in Etkin is time-invariant (see Etkin, paragraph [0044]). In contrast, amended claim 33 recites a method "... wherein a degree of alignment between beams emanating from the two entities is above a predetermined level for a predetermined length of time". As this claim is clearly time dependent, it is further distinguishable in view of Etkin.

Claims 34-36 are dependent on claim 33 and are allowable for the same reasons stated above.

Claim Rejections - 35 USC §103(a)

Claims 23-32 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Etkin in view of United States Patent No. 6,894,643 to Guo et al. (hereinafter "Guo").

With respect to amended claims 23 and 27, the claims recite coordinating the use of beam forming between a base station and WTRU with beam forming capabilities. The transmitted beams are aligned with each other using the measured error in alignment between the two beams to determine a correction factor. As amended, claims 23 and 27 recite "determining a correction factor based on the measured error" and selecting at least one adjustment parameter "in accordance with the correction factor". Neither Etkin nor Guo alone or in combination teach or disclose the determination and use of a correction factor as claimed in the present invention.

Etkin fails to teach both a method of coordinating beam patterns and aligning communications beams between a base station and a WTRU in a wireless communications system. In Etkin, a base station adjusts beam width and SINR fluctuations based on the number of mobile stations in a sector served by the base station. Etkin further discloses that for a small number of users a broader beam is better whereas a highly directional beam is better for a large number of users. Etkin is related to an effect of beam sweeping by the base station. In comparison to the claimed invention, Etkin fails to disclose a scheme of measuring an error in alignment of two beams emanating from the base station and the WTRU, determining a correction factor based on the measured error, and readjusting the beams to realign the two beams as recited in amended claims 23 and 27.

Guo teaches a method where the output signal is compared with a reference signal using a substitution element to create a difference signal. This difference signal is then used to adjust the weights applied to multipliers (see Guo, column 11, lines 61-67).

Guo differs from the method recited in amended claims 23 and 27 of the present invention in several important ways. First, the compared signals in the present invention are compared to each other and not, as is taught in Guo, to a standard reference signal. This is distinguishable from Guo as Guo fails to teach a method having two beams emanating from two different entities. Second, the error that is being measured in the present invention is the error in one alignment of two transmitted signals, not the error between an output signal and a reference signal. Finally, the present invention does not use its error measurement to create a separate signal. Rather, the error measured is used to align beams from two separate entities.

Accordingly, it is submitted that claims 23 and 27 are allowable over Etkin in view of Guo. Claims 24-26 and 28-32 are dependent upon claims 23, and 27, respectively, which the Applicants submit are allowable over the cited prior art for the same reasons provided above with regard to claims 23 and 27.

Claims 1-11 and 19-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Etkin and Guo in further view of United States Patent No. 6,665,545 to Raleigh et al. (hereinafter "Raleigh").

With respect to claims 1, 6, and 19, for the reasons stated above with regard to claims 23 and 27, any combination of Etkin and Guo fails to teach the methods of claims 1, 6, and 19.

Raleigh teaches a method for beam forming at a base station without any knowledge of array geometry or mobile feedback (see Raleigh, abstract). The basic approach of Raleigh is to estimate the optimum transmit antenna beam pattern based on certain statistical properties of the received antenna array signal (see Raleigh, column 3, lines 47-49). More specifically, Raleigh teaches that the "calibration procedure and apparatus described herein corrects for differences in the amplitude and phase match between the signal paths through the transceiver corresponding to each antenna element of the frequency channels." (See Raleigh, column 21, lines 36-40.) Raleigh is not related to the adjustment of beams for realignment of misaligned beams using a correction factor based on a measured error as presently claimed.

Accordingly, it is submitted that claims 1, 6, and 19 are allowable over Etkin and Guo in further view of Raleigh. Claims 2-5, 7-11, and 20-22 are dependent upon claims 1, 6, and 19, respectively, which the Applicants submit are allowable

over the cited art for the same reasons provided above with regards to claims 1, 6, and 19.

Claims 12-18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Etkin, Guo, and Raleigh in further view of U.S. Patent No. 6,768,454 to Kingsley et al. (hereinafter "Kingsley").

With respect to claim 12, for the reasons stated above with regard to claims 1, 23, 27, 6, and 19, any combination of Etkin, Guo and Raleigh fails to teach the method of claim 12. Further, Kingsley only teaches a system containing an array of dielectric resonator antennas which can be activated to produce a steerable transmission beam which may be steered through a predetermined angle (see Kingsley, column 3, lines 20-26). Kingsley fails to disclose a method for coordinating the use of beam forming between a base station and a WTRU as recited in amended claim 12. As such, any combination, in whole or in part, with Kingsley does not teach the method of claim 12.

Accordingly, it is submitted that claim 12 is allowable over Etkin, Guo, and Raleigh in further view of Kingsley. Claims 13-18 are dependent upon claim 12, which the Applicants submit are allowable over the cited art for the same reasons provided above with regard to claim 12.

Applicant: Chotkowski et al.
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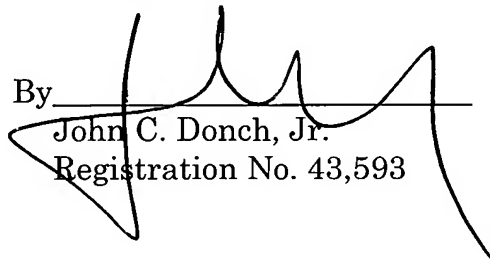
CONCLUSION

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claims 1-36, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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